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Running IBM Lotus Domino on VMware Or “We want to virtualize *absolutely everything*”

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About me – my fav slide

- Domino consultant for over a decade
- Domino, VMware and BlackBerry certified
- <http://blog.darrenduke.net>
- Oddles of DAOS and VMware experience

Agenda

- Myths, Truths and Old Wives Tales
- Should you virtualize?
- Easy ones and the basics
- Performance
- Domino infrastructure
- Vmware infrastructure
- Finally....

Myths, Truths and Old Wives Tales

- Can you run Domino on VMWare?
 - Yes, but only with proper planning, testing and tuning
- One should not run high I/O apps (like e-mail) in VMWare
 - False, but you should plan, test and tune
- The bottlenecks are not always where you think

Why you should virtualize

- Your boss tells you that you have to - ;)
- You have a business case:
 - For DR/HA via VMware Site Recovery, et al
 - Consolidation/Upgrade refresh
 - Consolidation of servers
 - Ease issues with hardware upgrades
 - Your current Domino server is 15 years old
 - No, really we see this *all the time*

Why you should NOT virtualize

- Your boss tells you that you have to
- You are doing it to be “cool”
- You are lacking a specific business case
- You are using a pSeries or an iSeries
 - Really? You want this kind of headache?
 - You already have 99.999% up-time
- You have iNotes users and run Windows
- To replace Domino clustering

The easy ones

- Do not use any P2V tool
 - Rebuilt it, they will come
 - Crap in, crap out
- Start small, pick BES not a 2,000 user mail server
 - You will learn a whole lot!
- Know what you current environment is doing before you virtualize it

The easy ones - cont

- Know your hardware
 - And the impact Domino 8.5.x will have on it
- Are you currently using shared storage?
 - Are you going to it during this “migration”
- Know the license ramifications
 - Speak to your IBM Partner about this. This is important!
 - PVU to vPVU, Nehalem, etc

The easy ones - cont

- Domino virtualization is a team sport
 - Domino admins
 - SAN admins
 - Network admins
 - VM admins
- But each has a different agenda
 - You can please some of the people some of the time.....

The Basics

- Domino runs best on a single vCPU
 - Try it, you'll see, however try to keep your v-specs the same as a physical server
- Storage options
 - As fast as you can afford, both drive speed and connectivity
 - 15k+ RPM and smaller sized drives are better
 - RAID 10 can be your friend
 - Local
 - SAN/NAS

The Basics - cont

- We are talking about ESX and ESXi
 - Not VMware Server
 - Not VMware Workstation
 - And certainly not HyperV
- Yes, ESXi is absolutely fine
 - Buy support if you plan to run in production
 - Platinum = 24 x 7
 - Gold = 12 x 5

The Basics - cont

- There is currently an issue with ESX and Windows Domino web servers
 - Sluggish response
 - VMware are aware of the issue
 - See IBM Tech-note 1331074
- Never, ever, let the server RAM balloon
 - Give it all the RAM it wants
 - vSphere 4 is your friend

Performance RAM

- If you are using 64 bit Windows
 - Use a 64 bit OS
 - Use a 64 bit Domino server
 - Give it as much RAM as you can
- For 32 bit Windows
 - Give it 4GB of RAM
- Enable “unlimited” memory in VIC

Performance RAM - cont

- If you are using Linux
 - It doesn't have the RAM issues Windows has
 - Give it 4GB RAM
- Do not, ever, let the server RAM balloon
 - Give it all the RAM it wants
 - vSphere 4 is your friend
 - Hot add

Performance – SAN Disks

- A single LUN per VM disk
 - Do not share!
 - This is why RDMs can look, feel and behave faster
 - This can be a VMDK (see above)
- Separate LUN for OS, Page and Domino code
- Separate LUN for Domino Data
- Separate LUN for Transaction Logs
- Yes, your SAN admin will hate you!

Performance – SAN Disks

- Neither NFS nor 1GB iSCSI is recommended
- Fast HBA and fabric
 - 4Gb is 2x faster than 2Gb
 - 8Gb is 2x faster than 4Gb
 - No, it really is that simple
- Follow best practices for your SAN and fabric
 - Be sure to align if you need to

Performance – Other disks

● Local disk

- Multiple servers on same local disk...NO!
 - Not supported by IBM
 - Well, maybe if you have 10 or so users
- RAID 10 is your friend
- Can use local disk tx logging for low user counts
 - < 250, be sure to test

● NFS

- Use this only for ISOs and exe storage

Performance – Stats

● Domino Statistics

- Disk Queue length should be as close to 2
- Degraded if ≥ 12 , significantly so

● ESX

- Esxtop is your friend, see what your server is doing
- Disk latency
 - 5ms is ideal
 - ≥ 10 ms needs looking at

Performance – Stats

- If you have an issue, needle in a haystack
 - SAN cache
 - Incorrect fiber configuration
 - Slow SAN
 - HBA configuration issues
- Know your hardware before you load it
- iSCSI @ 10G Ethernet
- Fiber @ 4+ Gbps (8 if you plan on scaling)

Performance – Disk types

- Like religion, politics and anti-virus providers...
- VMDK vs RDM
 - I personally have seen better performance *post implementation* using RDM (see below on why)
 - However, IF you to adhere to one VMDK per LUN
 - This can be faster and recommended
- Bottom-line, test, test, test
 - Prior to *implementation*
- Align if needed - <http://tinyurl.com/y3gdup>

Performance – Networking

- Segment different traffic to separate physical NICs
 - Server to server (non cluster)
 - Replication
 - Mail routing
 - Server to client, client to server
 - Clustering
- Remember 4 vNIC max per VM, use them
- If you have the CPU cycles, compress the TCP port traffic (on Domino)

Performance – Networking - cont

- If your bottleneck is not disk I/O then
 - It is probably NIC related
 - They are cheap, yet time and time again we see issues in this area
 - It could be your switches or the configuration thereof
 - Linksys != Cisco :)

Performance – Domino

- Disable all un-used tasks in the server notes.ini
- Disable TX Logs for ancillary NSF files
 - See Andy Pedisich's blog, <http://tinyurl.com/lqwv8v>
- Make sure your VMDK versions are updated
 - Should match you ESX version
 - ESX 3.0 is much faster I/O than 2.x
- Domino 8.5.x has 30-35% less I/O
- Prevent ballooning at all costs

Performance – Domino - cont

- Are you sure you need to AV scan EVERY write?
 - Investigate having a central AV Domino server
 - Maybe even (shock!) a non VM
- Install VMware Tools (and keep updated)
 - Ensure OS time is sync'd
- Separate LUNs
- Start with 1 vCPU
 - If you must do 2, check it is being used
 - UPDATERS=x (where x is vCPU count)

Domino Infrastructure

- Using LDAP?
 - Create a Domino server just for that
 - You can have more than 1 LDAP server
- Move the Administration Server to distinct Domino server, makes future upgrades simple
- You may need to mix and match drive types
 - VMDK for data
 - RDM for TX Logs

Domino Infrastructure - cont

- N/D 8.5.1 and DAOS is your friend
 - Server to server replication
 - DAOS will NOT resend known NLO's
 - Does not work for clustering
 - Client to server
 - Reply, reply to all and forward will NOT send (from the client) known NLOs
 - Less network, less I/O, less CPU

Domino Infrastructure - cont

- Do not try to match your physical servers
 - One 8 way x64 != One single vCPU ESX guest
 - Split the load between many, smaller guests
 - Keep away from 4 vCPU guests
 - Indeed, try to keep to 1 vCPU
- Do not share NICs with Domino
 - Give each Domino guest a dedicated NIC
 - Compress TCP port on server AND client

VMware Infrastructure

- Watch your shares
 - Both RAM, CPU and disk
 - Assign as appropriate
- Jumbo frames and vLANs *can* be your friend
- Do you really need to DRS or HA Domino?
 - Domino clustering is much, much easier
 - High I/O loads are slow to DRS
- Do not over commit resources Domino hosts

VMware Infrastructure - cont

- Remove snapshots as soon as practicably possible
- Don't forget to defrag Windows guests
- vSphere 4 can be 3-10% faster depending on loads
 - Only runs on x64 host hardware
 - For x32 hosts you will still need ESX 3.5
- Intel Nehalem CPUs can provide a boost w/4.x

VMware Infrastructure - cont

- Keep your ESX servers patched and current
 - Including U levels
- Watch for updated drivers from VMware
 - See if they are a better match for your environment
 - Specifically NIC drivers, jumbo frames, etc

And Finally....

- There is no silver bullet - sorry
- Each VMware environment is different
- Test, test and test
- Try different configurations
 - Server.Load / NotesBench
- In production, be sure to monitor
 - VMware AppSpeed
- YMMV (your mileage may vary)



We are here to help

- For further information contact or to schedule services
 - Lisa Duke, lisa.duke@simplified-tech.com or 678 378 4278
 - Ernie Sutter, ernie.sutter@simplified-tech.com or 404 931 5786
- Lots more information on the STS web site and blog:
 - <http://www.simplified-tech.com>
 - <http://blog.darrenduke.net>
 - Twitter – be sure to follow darrenduke and simplifiedtech
- We are an authorized IBM, RIM, VMware and Symantec reseller for new sales and renewals
- R6.5 is being “End Of Life” in April 2010.

